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SMUTS AND RUSTS OF NORTHERN UTAH AND SOUTHERN IDAHO

GEORGE L. ZUNDEL

The fungi listed in the following paper were secured from two principal sources. In the first place the author collected a number of smuts and rusts while on his vacation during August, 1920. The next source of material was the herbarium of Dr. C. N. Jensen, formerly plant pathologist of the Utah Experiment Station at Logan, Utah. This material was secured from the biology department of the Brigham Young College at Logan, Utah. Besides the above two sources of material, miscellaneous collections that have been sent to the author have also been included. In some instances these miscellaneous collections are outside of Northern Utah or Southern Idaho. Where no credit is given it is the author's own collection.

The papers on the Smuts and Rusts of Utah by Prof. O. A. Garrett have been consulted in the preparation of this paper.

The author found that in Box Elder County, Utah, *Ustilago bromivora* was attacking *Bromus tectorum* in epiphytotic form. As a boy the author botanized in this section of the State without seeing this smut. In August, 1920, however, he found hundreds of acres infected with this smut with an average infection of from 98 per cent to 99 per cent.

SMUTS

TILLETIA ASPERIFOLIA El. & Ev.; Jour. Myc. 3: 55. 1887

On *Sporobolus asperifolia* (Ness. & Mey.) Thurb. At corner of 3d North Street and 2d East Street, Logan, Cache County, Utah, August 3, 1920 (98 per cent infection); a quarter mile north of Oregon Short Line Railroad depot, Logan, Cache County, Utah, August 4, 1920 (98 per cent infection); West of Logan, Cache County, Utah, on Oregon Short Line Railroad, August 4, 1920 (85 per cent infection); near Utah-Idaho Central Railroad, Five Points, Weber County, Utah, August 14, 1920 (98 per cent infection); one mile south of Brigham City, Box Elder County, Utah, August 16, 1920 (75 per cent infection); Perry, Box Elder County, Utah, August 18, 1920 (infection only a trace).

TILLETIA FOETANS (B. & C.) Trel. Par. Fungi, Wisc. 35. 1884

On *Triticum* sp. (cultivated wheat); Beaver, Beaver County, Utah, August 21, 1918 (H. A. Christiansen); Monticella, San Juan County, Utah, September 1918 (C. O. Stott); Kanab, Kane County, Utah, August 1918 (Hugh Hurst); Cedar City, Iron County, Utah, September 1918 (Alma Esplin); Aberdeen, Bingham County, Idaho, September 8, 1918.

TILLETIA TRITICI (Bjerk.) Wint.; Rab, Kryp. Fl. 1: 110. 1881

On *Triticum* sp. (cultivated wheat), Loa, Wayne County, Utah, September, 1918 (A. E. Smith); North Logan, Cache County, Utah, August 5, 1920; American Falls, Power County, Idaho, September 9, 1918; Rockland, Power County, Idaho, September 9, 1918; Winchester, Lewis County, Idaho, August 28, 1918.

USTILAGO BROMIVORA (Tul.) Fisch. de Waldh. Bull. Soc. Nat. Mosc.

401: 252. 1867

On *Bromus marginatus* Nees., Mountain south of canyon road, Logan, Cache County, Utah, August 10, 1912 (C. N. Jensen, No. 238).

On *Bromus tectorum* L., Utah Agricultural College Campus, Logan, Cache County, Utah (85 per cent infection; Zundel & Richards) August 3, 1920; Utah Agricultural College Campus, main entrance, Logan, Cache County, Utah, August 3, 1920 (75 per cent infection); mouth of Logan Canyon, Cache County, Utah, August 4, 1920 (20 per cent infection); one mile up Logan Canyon, Cache County, Utah, August 4, 1920 (90 per cent infection); North Logan, Cache County, Utah, August 5, 1920 (4 per cent infection); Logan Canyon at Birch Glen, Cache County, Utah, August 7, 1920 (50 per cent infection); Logan Canyon at Rick's Spring, Cache County, Utah, August 7, 1920 (50 per cent infection); Ideal Beach on Bear Lake, Rich County, Utah, August 7 and 8, 1920 (3 per cent infection); West of Newton, Cache County, Utah, August 11, 1920 (30 per cent infection); Clarkston, Cache County, Utah, August 11, 1920 (15 per cent infection); Wandamere Park, Salt Lake City, Salt Lake County, Utah, August 13, 1920 (90 per cent infection); University of Utah Campus, Salt Lake City, Salt Lake County, Utah; August 13, 1920 (98 per cent infection); Lagoon Resort, Farmington, Davis County, Utah, August 14, 1920 (8 per cent infection); Five Points, Weber County, Utah (less than 1 per cent infection); Reservoir Hill, Brigham City, Box Elder County, Utah, August 16, 1920 (80 per cent to 99 per cent infection); South on Utah Idaho Central Railroad, Brigham City, Box Elder County, Utah, August 16, 1920 (85 per cent infection); Box Elder Creek, North of Brigham City, Box Elder County, Utah, August 17, 1920 (95 per cent infection); Perry, Box Elder County, Utah, August 18, 1920 (8 per cent infection); Fish Haven, Bear Lake County, Idaho, August 8, 1920 (2 per cent to 99 per cent infection); Tyhee, Bannock County, Idaho, August 19, 1920 (trace of infection); 1014 W. Fremont Street, Pocatello, Bannock County, Idaho, August 20, 1920 (15 per cent infection); Hills East of Pocatello, Bannock County, Idaho, August 20, 1920 (10 per cent infection).

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USTILAGO HORDEI (Pers.) Kel. & Swing., Ann. Rep. Kans. Agr. Exp.
Sta. 2: 268. 1890

On *Hordeum* sp. cult., Beaver, Beaver County, Utah (Christiansen).

USTILAGO LORENTZIANA Thum. Flora 63: 30. 1880

On *Hordeum jubatum* L. Logan, Cache County, Utah, August 5, 1912 (Jensen No. 220); Beaver, Beaver County, Utah, August, 1917 (Christiansen); Logan, Cache County, Utah, August 3, 1920 (90 per cent infection); Logan Canyon, Cache County, Utah, August 7, 1920 (5 per cent infection); Ideal Beach near South end of Bear Lake, Rich County, Utah, August 8, 1920 (30 per cent infection); Bloomington, Bear Lake County, Idaho, August 8, 1920 (8 per cent infection); Tyhee, Bannock County, Idaho, August 19, 1920 (trace of infection); East Halliday Street, Pocatello, Bannock County, Idaho, August 20, 1920 (3 per cent infection); near subway, O. S. L. R. R., Pocatello, Bannock County, Idaho (25 per cent infection).

USTILAGO LONGISSIMA (SNOW.) Tul. Ann. Sci. Nat. 111, 7: 76. 1847

On leaves of *Glycera grandis* Wats.—Banks of Logan River, West of Logan, Cache County, Utah, August 17, 1912 (Jensen No. 251).

USTILAGO MACROSPORA Desmaz. Pl. Crypt. II. 1727. 1850.

On leaves of *Elymus canadensis* L., Oregon Short Line Railroad West of Logan, Cache County, Utah, August 17, 1912 (Jensen No. 250).

USTILAGO TRITICI (Pers.) Rostr. Overs. K: Danske Vid. Selsk. Forh.
1890: 15 Mch, 1890

On *Triticum* sp. (cultivated wheat) Greenville, Cache County, Utah, June 17, 1918; Beaver, Beaver County, Utah, August, 1918 (Christiansen).

RUSTS

AECIDIUM ABUNDANS Pk. Bot. Gaz. 3: 34. 1878

On *Symphoricarpus* sp.—Mountains South of Canyon Road, Logan, Cache County, Utah, August 10, 1912 (Jensen No. 237).

AECIDIUM PHALARIS Pk.

On *Phalaris leucophylla*, Torr. Logan Canyon, Cache County, Utah, June 22, 1912 (Jensen No. 209).

GYMNOSPORANGIUM NELSONI Arth. Bull. Torr. Bot. Club 28: 665. 1901

I. On leaves of *Amelanchier alnifolia* Nutt. Dry Canyon, Cache County, Utah, August 2, 1912 (Jensen No. 277); Logan Canyon, Cache County, Utah, August 4, 1920.

MELAMSPORA CONFLUENS (Pers.) Jack. Brook. Bot. Gard. Mem. 1: 210. 1918

II. On *Salix* sp.—Banks of Logan River, West of Logan, Cache County, Utah, August 15, 1912 (Jensen No. 246); Logan Canyon, Cache County, Utah, August 7, 1920.

PHRAGMIDIUM AFFINE Syd. Ann. Myc. 2: 29. 1904

I. On *Potentilla gracilis* Dougl. Logan Nursery, Logan, Cache County, Utah, June 24, 1912 (Col. Leo Merrill; Jensen No. 212).

PHRAGMIDIUM IMITANS, Arth., N. A. Flora 7: 165. 1912

III. On *Rubus americana* (Pers.) Wint.—Forks of Logan Canyon, Cache County, Utah, August 17, 1912 (Coll. Zundel; Jensen No. 248).

II, III. On *Rubus strigosus* Michx. Forks Logan Canyon, Cache County, Utah, August 17, 1912 (coll. Zundel; Jensen No. 249); Logan Canyon, Cache County, Utah, August 7, 1920.

PHRAGMIDIUM NONTIVAGUM Arth. Torr. 9: 128. 1898

I, II. On *Rosa* sp. Dry Canyon, Cache County, Utah, August 2, 1912 (Jensen No. 224); Logan Canyon, Cache County, Utah, August 7, 1920.

POLYTHALIS THALICTRI (Cler.) Arth. Résult. Sci. Cong. Bot. Vienne 341. 1906

On *Thalictrum* sp. Logan Canyon at Birch Glen, Cache County, Utah, August 7, 1920.

PUCCINIA ABSINTHII (Hedw. f.) DC. Fl. Fr. 6: 56. 1815

II. On *Artemisia bigelovia* Gray, Providence Bench near Dry Canyon, Cache County, Utah, August 2, 1912 (Jensen No. 225).

II, III. On *Artemisia tridentata* Nutt, Providence Bench, near planing mill, Cache County, Utah, August 2, 1912 (Jensen No. 226). Forks of Logan Canyon, Cache County, Utah, August 19, 1912, Tony Grove, Logan Canyon, Cache County, Utah, August 8, 1920.

PUCCINIA BALSAMIORRHIZAE Pk. Bull. Torr. Bot. Club 11: 49. 1884

On *Balsamorhiza sagittata* (Pursh.) Nutt, Logan Canyon, Cache County, Utah, August 4, 1920.

PUCCINIA COMANDRAE Pk. Bull. Torr. Bot. Club 11: 49. 1884

III. On *Commandra pallida* DC. Logan Canyon, Cache County, Utah, June 22, 1912 (Jensen No. 211).

PUCCINIA CARICIS (Schum.) Schröt. Krypt. Fl. Schles. 3: 327. 1889

II. On *Carex aquatica* Wahl. Fish Hatchery West of Logan, Cache County, Utah, August 13, 1912 (Jensen No. 235).

PUCCINIA CLEMATIDIS (DC.) Lagerh. Tromso Mus. Aarsh. 17: 47. 1895

I. On *Clematis ligusticifolia* Nutt, Logan Canyon, Cache County, Utah, August 7, 1920.

PUCCINIA INTERMIXTA Pk. Bot. Gaz. 4: 231. 1879

On *Iva axillaris* Pursh. Perry, Box Elder County, Utah, August 18, 1920. (Det. H. S. Jackson.)

PUCCINIA JONESII Pk. Bot. Gaz. 6: 226. 1881.

I. On *Leptotaenia multifida* Nutt. Logan Canyon, Cache County, Utah, May 16, 1912 (Jensen No. 207) and III. June 22, 1912 (Jensen No. 208).

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PUCCINIA MALVACEARUM Bert. Gray's Hist. de Chile 8: 43. 1852

On cultivated *Althea*, Logan, Cache County, Utah, June 27, 1912 (Jensen No. 221).

On *Malva rotundifolia* L. Logan, Cache County, Utah, June 25, 1912 (Jensen No. 214).

PUCCINIA POLOGONI-AMPHIBII Pers. Syn. Fung. 227. 1801

On *Polygonum hartwrightii* Gray. West of Logan, Cache County, Utah, August 17, 1912 (Jensen No. 242). Det. J. C. Arthur.

PUCCINIA PROCERA Diet. Erythea 1: 249. 1893

II, III. On *Elymus* sp. Logan Canyon, Cache County, Utah, August 7, 1920.

PUCCINIA TARAXACI (Reb.) Plowr. Brit. Ured. & Ustil. 186. 1889.

II. On *Taraxacum officinale* L. Logan, Cache County, Utah, July 2, 1912 (Jensen No. 218).

PUCCINIA VERATRI Du Roi, Bot. Gall. 2: 890. 1830

I. On *Epilobium adenocaulon* Nutt. West of Logan, Cache County, Utah, August 17, 1912 (Jensen No. 240)

UROMYCES ERIOGONI El. & Arn. Bull. Calif. Acad. 1: 29. 1884

II, III. On *Eryogonum* sp. Foothills, Logan, Cache County, Utah, August 10, 1912 (Jensen No. 236).

UROMYCES GLYCYRRHIZAE (Rab.) Magn. Ber. der. Deutsch. Bot. Gesell.
8: 383. 1890

On *Glycyrrhiza lepidota* Nutt. Logan Canyon, Cache County, Utah, June 22, 1912 (Jensen No. 215); Clarkston, Cache County, Utah, August 12, 1920.

UROMYCES HEDYSARI-OBSCURI (DC.) Wint. Rabenh. Krypt. Fl. 1: 152. 1884

I, II. On *Hedysarum pabulare* A. Nels. Providence Bench, Cache County, Utah, August 2, 1912 (Jensen No. 223).

UROMYCES PROEMINENS (DC.) Pas. Fl. Franc. 2: 235. 1805; Rabenh.
Krypt. Fl. Europ. 1795. 1874

On *Euphorbia dentate* Michx. Perry, Box Elder County, Utah, August 18, 1920 (Det. H. S. Jackson).

UROPHYXIS SANGUINEA (Pk.) Arth. N. Am. Fl. 7: 155. 1907

On *Berberis aquifolium* Pursh. Logan Canyon at Birch Glen, Cache County, Utah, August 7, 1920.

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